IN THE CLAIMS

In this amendment, claims 5, 13-23, 80-86, 96, and 98-100 are pending. Claims 81 and 82 are amended. The status of all claims is provided below.

1-4. (canceled)

5. (previously presented) A process of making a device for conducting a unit operation comprising:

stacking a plurality of shims such that a continuous first flow path and a continuous second flow path are formed through the shims;

wherein the first and second flow paths are substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels perpendicular to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs perpendicular to shim thickness is not "substantially parallel to shim thickness";

wherein the plurality of shims comprises at least three adjacent shims through which the first flow path is formed and wherein a straight, unobstructed line is present through the first flow path in said at least three shims;

wherein the three shims are configured such that a unit operation can be performed on a fluid in the first flow path in which the straight, unobstructed line is present in said at least three adjacent shims; and

bonding the shims to form the device capable of performing the unit operation on a fluid; and

further comprising the steps of placing a first catalyst or sorbent in said first flow path and placing a second catalyst in the second flow path;

wherein the second catalyst is different than the first catalyst or sorbent.

6-12. (canceled)

13. (Previously presented) A process, comprising:

stacking a plurality of shims such that a continuous flow path is formed through the shims;

wherein the flow path is substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels perpendicular to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs perpendicular to shim thickness is not "substantially parallel to shim thickness";

wherein the plurality of shims comprises at least three shims through which the flow path is formed and a straight, unobstructed line is present through the flow path in said at least three shims;

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing the fluid into the device such that the fluid passes through the flow path in said at least three shims; and

performing the unit operation on the fluid as it passes through the flow path in which the straight, unobstructed line is present in said at least three shims;

wherein the unit operation comprises separating.

14. (previously presented) The process of claim 13 wherein the separating comprises distillation.

15. (Previously presented) The process of claim 13 wherein the flow path in said at least

three shims does not connect with any other flow paths.

16. (Previously presented) The process of claim 13 further comprising passing a second fluid through a second flow path in said at least three shims;

wherein the second flow path is substantially parallel to shim thickness.

17. (original) The process of claim 16 wherein the fluid in said flow path and the second fluid in said second flow path do not mix.

18. (original) The process of claim 17 wherein the fluid in said flow path and the second fluid in said second flow path in said at least three shims are separated by a distance of 5 mm or less and wherein the pressure in said flow path and the second flow path differ by at least 1 atm.

19. (previously presented) The process of claim 18 wherein the flow path has rounded edges and wherein the pressure in said flow path and the second flow path differ by at least 10 atm.

20. (original) The process of claim 18 wherein the fluid in said flow path and the second fluid in said second flow path in said at least three shims are separated by a distance of 1 mm or less and wherein the pressure in said flow path and the second flow path differ by at least 19 atm.

21. (original) The process of claim 17 wherein the fluid in the second flow path is a heat exchange fluid.

22. (original) The process of claim 18 wherein the flow path comprises first supports that extend across the flow path, and the second flow path comprises second supports that extend across the second flow path; and

wherein the first supports and the second supports are staggered.

23. (previously presented) The process of claim 17 wherein the second fluid comprises a reaction composition;

wherein the reaction composition reacts exothermically.

24-79. (canceled)

80. (previously presented) A process, comprising:

stacking a plurality of shims such that a continuous first flow path and a continuous second flow path are formed through the shims;

wherein the first and second flow paths are substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels perpendicular to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs perpendicular to shim thickness is not "substantially parallel to shim thickness";

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing a first fluid into the device such that the fluid passes through the first flow path in said plurality of shims; and

performing at least one first unit operation on the fluid as it passes through the first flow path in said plurality of shims;

wherein the first unit operation is selected from the group consisting of distilling, adsorbing, separating, absorbing, and combinations of these;

passing a second fluid into the device such that the fluid passes through the second flow path in said plurality of shims; and

performing at least one second unit operation on the fluid as it passes through the second flow path in said plurality of shims;

wherein the second unit operation comprises an exothermic reaction; and

wherein the first and second unit operations are different;

wherein the plurality of shims comprises at least three shims through which the first flow path is formed and wherein a straight line can be drawn through the first flow path in said at least three shims; and

wherein the second flow path contains a catalyst.

81. (currently amended) A process, comprising:

stacking a plurality of shims such that a continuous first flow path and a continuous second flow path are formed through the shims;

wherein the first and second flow paths are substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels perpendicular to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs perpendicular to shim thickness is not "substantially parallel to shim thickness";

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing a first fluid into the device such that the fluid passes through the first flow path in said plurality of shims; and

performing at least one first unit operation on the fluid as it passes through the first flow path in said plurality of shims;

wherein the first unit operation is selected from the group consisting of distilling, adsorbing, separating, absorbing, and combinations of these;

passing a second fluid into the device such that the fluid passes through the second flow path in said plurality of shims; and

performing at least one second unit operation on the fluid as it passes through the second flow path in said plurality of shims;

wherein the second unit operation comprises reacting ~~is selected from the group~~

~~consisting of distilling, reacting, adsorbing, compressing, expanding, separating, absorbing, vaporizing, condensing, and combinations of these~~; and

wherein the first and second unit operations are different;

wherein the plurality of shims comprises at least three shims through which the first flow path is formed and wherein a straight line can be drawn through the first flow path in said at least three shims; and

wherein the second flow path contains a catalyst and an endothermic reaction is conducted in the second flow path.

82. (currently amended) A process, comprising:

stacking a plurality of shims such that a continuous microchannel flow path is formed through the shims;

wherein the microchannel flow path is substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels perpendicular to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs perpendicular to shim thickness is not "substantially parallel to shim thickness";

wherein the plurality of shims comprises at least three shims through which the microchannel flow path is formed and wherein the microchannel flow path in said at least three shims has a minimum dimension (height or width) of at least 10 μm;

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing the fluid into the device such that the fluid passes through the microchannel flow path in said at least three shims; and

performing the unit operation on the fluid as it passes through the microchannel flow path in which the straight, unobstructed line is present in said at least three shims;

wherein the ~~first~~ microchannel flow path comprises a metal film.

83. (previously presented) A process, comprising:

stacking a plurality of shims such that a continuous first flow path and a continuous second flow path are formed through the shims;

wherein the first and second flow paths are substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels perpendicular to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs perpendicular to shim thickness is not "substantially parallel to shim thickness";

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing a first fluid into the device such that the fluid passes through the first flow path in said plurality of shims; and

performing at least one first unit operation on the fluid as it passes through the first flow path in said plurality of shims;

wherein the first unit operation is selected from the group consisting of distilling, adsorbing, separating, absorbing, and combinations of these;

passing a second fluid into the device such that the fluid passes through the second flow path in said plurality of shims; and

performing at least one second unit operation on the fluid as it passes through the second flow path in said plurality of shims;

wherein the second unit operation is selected from the group consisting of distilling, reacting, adsorbing, compressing, expanding, separating, absorbing, vaporizing, condensing, and combinations of these; and

wherein the first and second unit operations are different;

wherein the plurality of shims comprises at least three shims through which the first flow path is formed and wherein a straight line can be drawn through the first flow path in said at least

three shims; and

wherein the first flow path comprises a metal film on the edge of the flow path.

84. (previously presented) A process, comprising:

stacking a plurality of shims such that a continuous first flow path and a continuous second flow path are formed through the shims;

wherein the first and second flow paths are substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels perpendicular to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs perpendicular to shim thickness is not "substantially parallel to shim thickness";

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing a first fluid into the device such that the fluid passes through the first flow path in said plurality of shims; and

performing at least one first unit operation on the fluid as it passes through the first flow path in said plurality of shims;

wherein the first unit operation is selected from the group consisting of distilling, adsorbing, separating, absorbing, and combinations of these;

passing a second fluid into the device such that the fluid passes through the second flow path in said plurality of shims; and

performing at least one second unit operation on the fluid as it passes through the second flow path in said plurality of shims;

wherein the second unit operation comprises reacting; and

wherein the first and second unit operations are different;

wherein the plurality of shims comprises at least three shims through which the first flow path is formed and wherein a straight line can be drawn through the first flow path in said at least

three shims; and

wherein the second flow path comprises a catalyst metal on an oxide support.

85. (previously presented) The process of claim 13 wherein the plurality of shims comprises at least five shims through which the flow path is formed and a straight, unobstructed line is present through the flow path in said at least five shims; and comprising

passing the fluid into the device such that the fluid passes through the flow path in said at least five shims; and

performing at least one unit operation on the fluid as it passes through the flow path in said at least five shims.

86. (previously presented)The process of claim 84 wherein the first flow path in said at least three shims does not connect with any other flow paths.

87-95. (canceled)

96. (previously presented) The process of claim 14 wherein the flow path in said at least three shims does not connect with any other flow paths.

97. (canceled)

98. (previously presented) The process of claim 5 wherein the second catalyst is placed in the second flow path by wash coating.

99. (previously presented) The process of claim 96 wherein the plurality of shims comprising at least three adjacent shims through which the flow path is formed comprises at least five adjacent shims through which the flow path is formed and wherein a straight, unobstructed line is present through the flow path in said at least five shims.

100. (previously presented) The process of claim 13 wherein the plurality of shims comprising at least three adjacent shims through which the flow path is formed comprises at least five adjacent shims through which the flow path is formed and wherein a straight, unobstructed line is present through the flow path in said at least five shims.

101. (canceled)